ATTACHMENT 1

PROCEDURES FOR FIELD MONITORING AND SAMPLING ACTIVITIES ASSOCIATED WITH THE SOIL MANAGEMENT PLAN (SMP) FOR 501 ELLIS STREET, MOUNTAIN VIEW, CALIFORNIA

August 22, 2014

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1.0 INTRODUCTION

The purpose of this document is to detail field monitoring and sampling procedures which will be employed as required by the site-specific Soil Management Plan (SMP) for improvement activities at 501 Ellis Street in Mountain View, CA. The purpose of the SMP is to provide guidance for subsurface development activities in consideration of historical contamination of volatile organic compounds (VOCs), in particular chlorinated solvents. Field oversight activities include:

- Trench perimeter total volatile organic compound (TVOC) monitoring;
- Personal air sampling for trichloroethylene (TCE) by organic vapor monitors (OVM);
- Soil headspace screening;
- Visual observations of soil conditions in the excavated areas;
- Soil sampling and laboratory analysis;
- Surplus soil waste characterization for off-Site disposal; and,
- Inspection and associated air sampling of slab penetrations.

Procedures for implementing these activities are detailed here. The scope of activities included is based on the site-specific environmental history of the Site as outlined in the SMP.

2.0 TRENCH PERIMETER TVOCS MONITORING

As outlined in the SMP, air sampling of the work area in the breathing-zone of trench workers will be performed in the field for the presence of VOCs using direct read (real time) monitors and the methods detailed in this section. A health and safety plan (HASP) will be developed by Devcon Construction Inc. (Devcon). Devcon's health and safety officer will be ultimately responsible for contractor worker health and safety. This section outlines worker health and safety procedures which will be incorporated into the HASP to be applied by the contractor conducting the work.

2.1 Calibration

The direct-read (real-time) monitors will be calibrated per the details in Section 4.1.

2.2 Sampling Approach and Frequency

A photo ionization detector (PID) capable of measuring down to at least 10 parts per billion by volume (ppbv) such as a ppbRAE 3000 PID with the appropriate lamp configuration will be used to monitor trenching perimeters to evaluate if areas outside the trench area are potentially impacted by trenching activities. Samples will be collected over 1 to 5 minute durations every 30 60 minutes around the perimeter of the trench.

Baseline PID samples will be collected for comparison each day, prior to excavation activities and in ambient air (at least 50 feet from the excavation area(s)).

2.3 Screening Level

A sample will be considered as possibly elevated if the PID reading is 500 parts per billion by volume (ppbv) or higher for 10 seconds or more (Screening Level). This Screening Level has been set by the United States Environmental Protection Agency (USEPA).

2.4 Response Actions

If PID readings are measured to be greater than 500 ppbv for 10 seconds or more in the breathing zone, air sampling with canisters may be performed during excavation activities to further measure the potential for workers outside of the trench to be exposed to chemicals of potential concern (COPCs). As detailed below, badge monitoring for TCE will be implemented for all trench workers within the excavation area(s). The results of this badge sampling will be used to assess TCE concentrations in the breathing zone of trench workers.

Should elevated PID readings be recorded in areas with no representative badge sampling, a representative grab canister sample will be collected from this air space and analyzed by the analytical laboratory by USEPA TO-15 SIM on a 24-hour turnaround time for the MEW vapor intrusion COPCs plus Freon 113. The TCE analytical results will be compared to both the EPA interim accelerated response action level for TCE of 7 $\mu g/m^3$ and the interim urgent response action level for TCE of 21 $\mu g/m^3$ (USEPA 2014).

Should the TCE results of the canister sampling exceed the accelerated response action level (7 $\mu g/m^3$), Devcon's health and safety office will be notified and additional fans to increase ventilation will be implemented in the vicinity of the air space with the exceedance. A notification to the EPA will be sent within 48 hours. Additionally, a representative 8-hour time weighted canister sample will be collected in the same air space where the exceedance was detected and analyzed by the analytical laboratory by USEPA TO-15 SIM on a 24-hour turnaround time for the MEW vapor intrusion COPCs plus Freon 113. Daily 8-hour canister sampling will continue until TCE concentrations are brought below the MEW cleanup standard of 5 $\mu g/m^3$.

Should the TCE concentrations detected during grab or 8-hour canister sampling exceed the urgent action level (21 $\mu g/m^3$), Devcon's health and safety officer will be notified, the EPA will be notified within 24 hours, and TCE badge sampling will be implemented as summarized in Section 3.0 below. Further fan ventilation will be used to reduce TCE concentrations in the air.

As discussed in Section 3.0 below, badge sampling may be suspended, in consultation with the EPA, if after two weeks there are no detections of TCE and no exceedances of the PID action level. Should TCE badge sampling be suspended, TVOC field monitoring will be extended to include both the perimeter and ambient air within the trench. Under this scenario, grab canister sampling will occur if the PID readings exceed the action

level. Additionally, TCE badge sampling will be re-employed if the urgent action level is exceeded.

2.5 Recordkeeping

The recordkeeping requirements detailed in Section 4.6 will be followed.

3.0 PERSONAL AIR SAMPLING FOR TRICHLOROETHYLENE (TCE) BY ORGANIC VAPOR MONITORS (OVM)

As required by the SMP, TCE badge sampling will be implemented for trench workers. A health and safety plan (HASP) will be developed by Devcon. The health and safety officer will be ultimately responsible for contractor health and safety. This section outlines worker health and safety procedures which will be incorporated into the HASP to be applied by the contractor conducting the work.

3.1 Sampling Approach

Representative trenching crew members will be monitored using a TCE sampling badge (*e.g.,* Radiello 130). The TCE sampling badge will be used following the manufacturer's sampling instructions. Samples will be initially submitted under chain of custody with an expedited turn around time request of 24 hours to an accredited laboratory proficient in USEPA analytical methods. The badges will be analyzed for TCE concentrations by gas chromatography/mass spectrometry (GC/MS) – Selected Ion Monitoring (SIM). If TCE is detected during badge sampling, PID measurements will be periodically collected near badge workers. The TCE badge sampling results will be used to develop a correlation with the PID readings. In consultation with the EPA, the PID Screening Level may be modified based on this correlation.

If initial sampling results do not indicate elevated airborne TCE levels, samples will be subsequently submitted with a 3 5 day turn around time request.

3.2 Sampling Frequency

The appropriate site-specific sampling frequency should be determined by Devcon's health and safety officer. Samplers will be placed on workers in areas which may have relatively higher vapor concentrations, such as trenches or poorly ventilated areas.

3.3 Action Level

The analytical results will be compared to the EPA interim urgent response action level for TCE of 21 $\mu g/m^3$ (USEPA 2014).

3.4 Response Action

Should the results of the TCE badge sampling exceed the action level, additional measures to reduce vapor concentrations in the worker breathing zone will be

implemented, potentially including local trench ventilation via fans. Additionally, the EPA will be notified within 24 hours.

Following the initial two weeks of daily badge sampling, a decision to cease badge sampling may be made in consultation with the EPA if the results of badge sampling exhibit no detections of TCE and if the real-time PID monitoring described in Section 2.0 does not exceed the action level. If badge sampling is suspended, real-time TVOC sampling will occur in the breathing zone within the trench and compared to the action level detailed in Section 2.2. We will be prepared to collect grab canister samples as outlined in Section 2.4 if the real-time action level detailed in Section 2.2 is exceeded. Additionally, badge sampling will be re-employed if this action-level is exceeded.

3.5 Recordkeeping

The recordkeeping requirements detailed in Section 4.6 will be followed.

4.0 SOIL HEADSPACE SCREENING

As required by the SMP, soils will be field-screened for the presence of VOCs. Field screening will occur using a PID that measures down to the 10 ppbv range.

4.1 Calibration

PID monitoring instruments will be calibrated daily, before obtaining measurements. This information will be recorded to demonstrate that the PID equipment was properly calibrated and remained operable in the field. The PID will be calibrated as follows:

- Fully charge the PID (equipped with a 10.6 eV lamp) prior to use.
- Conduct a zero "fresh" air calibration in the field (using a carbon filter attachment) at an upwind or ambient location following the manufacturer's manual instructions.
- Calibrate the PID in accordance with the manufacturer's manual using 10 parts per million by volume isobutylene calibration standards.
- If instrument readings appear to be irregular or drifting, attempt to recalibrate the PID before collecting additional data. Flag apparent instrument drift or erratic instrument readings on field datasheets used to record data. If the instrument cannot be recalibrated, take the instrument out of service and replace it with a different unit that is capable of being calibrated and used with reliability.
- Submit PID equipment to the manufacturer on a yearly basis to document that the equipment is certified for use and in good working condition. If the initial factory calibration is older than one year, then the first internal calibration will be established one year after the initial purchase and each year thereafter. Place copies of the factory calibration sheets in the logbook.

4.2 Soil Screening Procedure

The procedure for soil screening is as follows:

- A soil sample from the excavated soil will be placed into an unused re sealable Ziplock plastic bag with a minimum volume of one quart, until the container is approximately one half full;
- The container will be sealed and soil crumbled by hand, if possible, while inside the bag;
- After at least 2 minutes, the container will be opened enough to allow the PID probe into the headspace of the plastic bag;
- The sample will be considered as possibly contaminated if the PID reading is 500 ppbv or higher for 10 seconds or more; and,
- The PID used for the headspace soil screening will be a PID that is properly calibrated in accordance with the manufacturer's requirements and the appropriate lamp configuration and capable of VOC readings in the 10 ppbv range such as a ppbRAE 3000.

Soil that is field screened/tested and cleared using the field head space method with the PID can be considered clean and can be re used for onsite backfill.

4.3 Frequency of Sampling

The soil screening will be performed with the PID as follows:

- Hardscape and landscape materials (e.g., planting materials) will not be field screened.
- For soil scraping/grading excavations, depth of 2 feet or less: at least one soil sample for every 15 - 20 cubic yards of excavated soil
- For all soil trenching excavations: at least one soil sample for every 5 cubic yards of excavated soil, or every 10 linear feet of excavation

4.4 Screening Level

Excavated soil that has continuous PID readings of 500 ppbv or greater for at least ten seconds will be designated as "potentially contaminated soil". This soil will be sampled using the procedure outlined in Section 6.0.

4.5 Field Controls

Potentially contaminated soil will then be segregated, stockpiled and covered with a plastic tarp at a designated, plastic lined stockpile area or covered roll off container, pending further analytical testing. Trenches will be covered with plywood, metal covers or other similar method when access to the trench is not required.

4.6 Recordkeeping

Field notes will be taken to document all events, equipment used, and measurements collected during the monitoring activities. The notes should include field data for the field screening including:

- Monitoring results;
- Meteorological conditions;
- Field observations during sampling event; and,
- Problems encountered and any deviations made from the established sampling protocol.

Additional information which should be included in the field logbook may include:

- Names, addresses and phone numbers of the field contact (inside logbook cover) including the Devcon and EPA Project Managers and the Iris Environmental Project Manager/Task Manager and/or Project Engineer;
- Name and role of logbook note taker;
- Date on each page and time for each entry;
- Time of site arrival and departure;
- Names, affiliations, and responsibilities of personnel on the Site;
- Summary of important meetings or discussions with federal, state, or local regulatory agencies;
- General description of each day's field activities;
- Documentation of weather conditions during sampling including approximate temperature, predominant wind direction, and any precipitation;
- Sample location descriptions;
- Site sketch showing sample;
- Photograph information;
- Observations of sample collection environment (e.g., ambient odor);
- Identification of sampling device, including equipment model and serial number;
- Equipment calibration data;
- Field sample identification number;
- Type of sample matrix (e.g., soil);
- Date and time of sample collection;
- Sampler's name;

- Sample type (e.g., grab, duplicate)
- All associations between and identification numbers of environmental samples, duplicates, and equipment blanks;
- Preliminary sample descriptions (e.g., non native source material such as petroleum based product observed in soil);
- Shipping arrangements (e.g., tracking number for overnight courier service);
- Recipient laboratories;
- Levels of safety protection worn by field personnel;
- Deviations from these procedures; and
- Changes in personnel and responsibilities, along with reasons for the changes.

5.0 VISUAL OBSERVATIONS OF SOIL CONDITIONS IN THE EXCAVATED AREAS

Excavated soil will be visually observed for evidence of moisture, discoloration, and/or staining. If this is observed, soils will be designated as "potentially contaminated soil". This potentially contaminated soil will then be segregated, stockpiled and covered with a plastic tarp at a designated, plastic lined stockpile area or covered roll off container, pending further analytical testing. Trenches will be covered with plywood, metal covers or other similar method when access to the trench is not required. If "potentially contaminated soils" are encountered, Sections 4.5, 4.6, and 6.0 will be followed.

6.0 SOIL SAMPLING AND LABORATORY ANALYSIS

6.1 Sampling Procedures

Additional analytical testing will be performed on soils designated as "potentially contaminated soil" per Sections 4.0 or 5.0. Soil samples will be collected from stockpiles of the "potentially contaminated soil" by USEPA Method 5035. An example of a sampler compliant with USEPA Method 5035 is the EnCore™ Sampler. One sample will be collected approximately per each 10 cubic yards for stockpiles less than 100 cubic yards. Stockpiles greater than 100 cubic yards will be sampled with a reduced frequency consistent with the guidance provided in DTSC's *Information Advisory Clean Imported Fill Material* (Cal/EPA, 2001).

Collection at depth via an EnCore™ Sampler is summarized as follows: a small subcore of soil is collected directly into the volumetric storage chamber of the sampler from a soil core or soil surface, filling it completely with zero headspace. The storage chamber is then capped to form an airtight seal. The intact samplers are placed into a plastic bag for transport to the laboratory at 4 ± 2°C. At the stationary laboratory, the soil content of the sampler is extruded into a prepared Volatile Organic Analyte (VOA) vial for analysis. Since the VOA vial may be used directly for analysis, it must be compatible with the stationary laboratory's purge and trap apparatus to avoid further sample handling which might promote VOC loss.

6.2 Analytical Methods

These samples will be sent to the analytically laboratory for, at a minimum, testing of:

- VOCs by EPA Method 8260B; and,
- TPH by EPA Method 8015B prepared using a silica gel cleanup method for TPH-d and TPH-mo.

Additional analyses shall be performed if there is evidence that other chemicals (e.g., non-volatile chemicals) may be present that could represent a potential health risk through direct contact by subsurface workers. Determination of whether other chemicals may be present would be based on field observation and professional judgment of a licensed or certified environmental professional and take into consideration the location of the excavation in relation to known source areas that have been previously investigated. Additional analyses may include the following:

- Title 22 total metals by EPA Method 6010;
- SVOCs by EPA Method 8270;
- PCBs/OCPs by EPA Method 8080; or
- Herbicides by EPA Method 8151.

6.3 Evaluation of Analytical Results

Analytical results from soil sampling will be compared to conservative screening levels. Conservative screening levels used to evaluate these soil data consist of the most protective screening level from the following sources:

- Screening levels specifically recommended by the Department of Toxic Substances Control (DTSC) in their Human Health Risk Assessment Note 3;
- USEPA Regional Screening Levels (RSLs);
- California Regional Water Quality Control Board (RWQCB) Environmental Screening Levels (ESLs); and
- Office of Environmental Health Hazard Assessment (OEHHA) California Human Health Screening Criteria (CHHSLs).

It is noted that these conservative screening levels are protective of direct exposures to soils under residential/unrestricted land use; and some of the screening levels (specifically, some of the ESLs) are even more conservative than necessary for protection of human health. Accordingly, exceedences of these screening levels do not necessarily imply an issue: only that further evaluation should be completed. If there are exceedances of the 2014 RSLs, the EPA shall be notified within 48 hours.

6.4 Quality Assurance/Quality Control (QA/QC) Methods

This section outlines the quality assurance/quality control (QA/QC) methods for the analytical and data management aspects of the environmental sampling procedures. The

purpose of this section is to ensure that the type, quality, and quantity of analytical data obtained during any soil sampling events are sufficient to support the objectives of the SMP.

6.4.1 Laboratory Reporting Limits

The reporting detection limits (RDLs) of the laboratory will be below the conservative screening levels outline in Section 6.3 to extent that available laboratory methods can attain these levels.

6.4.2 Sampling Collection and Quality Assurance

6.4.2.1 Equipment Decontamination

All equipment that comes into contact with potentially contaminated soil will be decontaminated between sampling locations.

After the collection of each soil sample and prior to further sampling, sampling equipment that will come into direct contact with samples, (i.e., sample sleeves, sampler, sampler shoe) will be decontaminated. The following is the recommended procedure required for the decontamination of reusable sampling equipment:

1. Wash equipment with nonphosphate detergent and potable water, using a scrub brush if necessary.
2. Rinse with potable water.
3. Rinse with deionized/distilled water.

Equipment that will not come into contact with the sample will be decontaminated on plastic sheeting. Materials to be stored for more than a few hours will be covered.

6.4.2.2 Sample Containers, Sample Volumes, Sample Preservation, And Holding Times

Soil samples will be collected from the stockpile(s). If additional soil samples are collected based on field conditions then soil samples will be obtained using stainless steel drive tubes with caps and teflon cap liners. Sub sampling by EPA Method 5035 will be performed directly or from the sample tube, as soon as possible after collection to reduce loss of volatile compounds.

One 6 inch sealed acetate liner or stainless steel sleeve will be provided for the required sample volume for non VOC chemical analyses, if needed. 40 ml VOA vials will be provided for soil samples for VOC analysis. Each VOC vial will have approximately 5 grams of soil added to the appropriate preservative (or none) as required by EPA Method 5035.

Groundwater samples are not anticipated. If required, they would be obtained in accordance with the EPA low flow (minimal drawdown) groundwater sampling

procedures (EPA/540/S 95/504). The samples would be placed in appropriate containers provided by the laboratory.

All soil or groundwater samples will be stored on Blue Ice or double bagged ice in a thermally insulated shipping container (i.e., cooler) immediately after sample collection and until the samples reach the laboratory to ensure that the samples are maintained at 4°C plus or minus 2°C.

The analytical holding time is the amount of time a sample or extract may be held from sample collection to sample extraction and analysis without the results being qualified due to the potential chemical degradation, analytes loss, or other changes.

6.4.2.3 Collection Methods

Descriptions of the sample collection methods that will be used for field activities performed during the sampling were previously provided. Media to be sampled may include soil samples only.

Samplers will don clean, nitrile (or equivalent) disposable gloves at each sample location. To maintain sample integrity, these gloves should be changed between soil sample intervals. Procedures previously described will minimize the possibility of cross contamination or unnecessary loss of contaminants in the investigation samples.

Samples will be hand delivered to the laboratories within 24 hours of sample collection or shipped by 24 hour air courier (e.g., Federal Express) following all Department of Transportation (DOT) regulations.

6.4.3 Data Validation

The data will be reviewed in the context of the following to determine the validity of the analytical data:

- Holding times;
- Instrument calibration;
- Detection and quantitation limits;
- Method blanks (MBs);
- Laboratory Control Samples (LCSs); and
- Matrix Spikes/Matrix Spike Duplicates (MS/MSDs)

7.0 SURPLUS SOIL WASTE CHARACTERIZATION FOR OFF-SITE DISPOSAL

Any surplus soils will be characterized prior to off site disposal. An appropriate number of samples will be collected from the stockpiles and analyzed for VOC, TPH (gasoline and diesel), and metals in accordance with EPA Method SW846 8260B; EPA Method SW846 8015B/3545A; and California Title 22 Metals (CAM 17). The samples will be

delivered under chain of custody to the analytical laboratory. Samples will be collected following the procedures detailed in Section 6.0 (see Sections 6.1, 6.4.2.2, and 6.4.2.3)

8.0 INSPECTIONS OF SLAB PENETRATIONS

It is anticipated that the proposed activities will penetrate the slab in some areas. These areas will be sealed following completion of the work. The potentially responsible party (PRP) or its representative will observe the replacement and repair. At a minimum, to evaluate the adequacy of the sealing, the following procedure will be followed:

- Prior to slab penetrating activities, collect three canister samples from areas of the building where penetrations are anticipated to occur. A location near historical maximum soil or groundwater detections will be selected to the extent possible. Potential locations are shown on Figure 1 of the main text. Samples will be collected over an 8-hour period. At the request of EPA, the location with historically elevated indoor air TCE concentration will be sampled, this is the location shown in the center of the building.
- Devcon has reviewed their proposed work activities and has confirmed that MEW COPC indoor source contamination from construction materials or work activities is unlikely.
- The heating, ventilation, and air conditioning (HVAC) units have been removed. The planned air sampling will be conducted with the HVAC-off. Accordingly, this indoor air sampling is solely for the purpose of evaluating the efficacy of the slab repairs and is not intended to be used to evaluate potential vapor intrusion exposure to future building occupants.
- The samples should be analyzed by the analytical laboratory by USEPA TO-15 SIM for the MEW vapor intrusion chemicals of potential concern and, at the request of EPA, Freon 113 as a potential tracer.
- In addition to the indoor air samples, an outdoor air sample will be collected and analyzed in the same manner to quantify concentrations of chemicals of potential concern which may be present in outdoor air which is brought into the building. If sampling activities at 501 and 515 Ellis occur on the same day, a single representative outdoor air location may be selected.
- Following completion of the work, the PRP or their representative will observe the replacement and repair of the slab. Details of the slab repair design are provided in Attachment 5. As part of these efforts, it is anticipated that the area where the expandable gasket plug was installed will be sealed.
- Once the sealing has been completed and the concrete has completed curing, a second canister sampling event will be conducted at the same locations as the samples collected prior to slab penetration. The sampling and analysis will be conducted in the same manner as the initial sample, including the inclusion of an outdoor air sample.

9.0 REPORTING

Following completion of the excavation project, a summary report will be prepared and submitted to EPA for review within 60 days of project completion. The report will include the following information:

- A summary of the project activities;
- A summary of the field headspace soil screening procedures and results;
- An estimate of the volume of excavated soil which exceeded the headspace soil screening criterion;
- Identification of the approximate location of excavated soil that exceeded the headspace soil screening criterion;
- A summary of laboratory analytical results of the stockpiled soil sampling and analytical data;
- An estimate of the volume of excavated soil which exceeded soil screening levels and categorized as exceeding the target clean up level on the basis of analytical lab testing results;
- Documentation (trench locations and stationing) including photographs that clearly identify the location of the affected soil and the disposition of the stockpiles and demonstrates the effective containment of the excavated soil;
- Documentation of air monitoring, sampling and laboratory analytical results;
- Copies of all laboratory analytical results and chains of custody; and,
- Copies of field notes and data sheets.

EPA shall be notified within 48 hours if contaminated soil is encountered exceeding EPA 2014 Regional Screening Levels or if the EPA interim TCE accelerated response action level is exceeded. EPA shall be notified within 24 hours if the EPA interim TCE urgent response action level are exceeded in the worker breathing zone. All sampling summaries and reports should be provided to EPA within 60 days of completion of the trenching activities.

Soil that is considered clean can be reused on site or transported off-Site to an approved landfill.

10.0 REFERENCES

California Environmental Protection Agency (Cal/EPA). 2001. *Information Advisory Clean Imported Fill Material.* Department of Toxic Substances Control (DTSC). October

United States Environmental Protection Agency (USEPA). 2014. *EPA Region 9 Response Action Levels and Recommendations to Address Near-Term Inhalation Exposures to TCE in Air from Subsurface Vapor Intrusion.* Region 9. June 30.